



The OECD Metropolitan Areas
Database *visualised through*
the Metropolitan eXplorer

<http://measuringurban.oecd.org>

A user's guide
Updated October, 2018th



The Metropolitan eXplorer offers an interactive visualisation of the 692 OECD metropolitan areas identified in 32 OECD countries¹ and the functional urban area of Luxembourg.

Comparable values and rankings of population, GDP, employment, and many other indicators can be displayed through different visual techniques developed by NComVA for the OECD.

Explore the visualisation

<http://measuringurban.oecd.org>

Give your feedback

GOV.RegionStat@oecd.org

¹ The OECD-EU definition of functional urban areas (FUA) has not been applied to Israel, New Zealand and Turkey.

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Introduction

The OECD, in cooperation with the EU, has developed a harmonised definition of urban areas which overcomes previous limitations linked to administrative definitions (OECD, 2012). According to this definition an urban area is a functional economic unit characterised by densely inhabited “city core” and “commuting zone” whose labour market is highly integrated with the core.

1) **City cores** are defined through gridded population data. The geographic building blocks to define functional urban areas are the municipalities (LAU2 in Eurostat terminology and the smaller administrative units for which national commuting data are available in non-European countries).

The population grid data for European countries comes from the Corine Land Cover dataset, produced by the Joint Research Centre for the European Environmental Agency (EEA). For all the non-European countries, gridded population data comes from the Landsat project.

A “city core” consists of a high-density cluster of contiguous grid cells of 1 km² with a density of at least 1,500 inhabitants per km², a lower threshold of 1,000 people for km² is applied to Australia, Canada and US. Small clusters (hosting less than 50,000 people in Australia, Canada, Chile, Colombia, Europe and the United States, 100,000 people in Japan, Korea and in Mexico) are dropped.

A municipality is defined as being part of an urban core if at least 50% of the population of the municipality lives within the urban cluster. If more than 15% of employed persons living in one city core work in another city core, these two city cores are combined into a single destination (to take into account policentricity).

2) **Commuting zones** are defined as all municipalities with at least 15% of their employed residents working in a certain city core. Municipalities surrounded by a single functional urban area are included and non-contiguous municipalities are dropped.

This methodology makes it possible to compare functional urban areas of similar size across countries. A classification of functional urban areas into four types according to population size is proposed:

- Small urban areas, with a population below 100 000 people;
- Medium-sized urban areas, with a population between 100 000 and 250 000;
- Metropolitan areas, with a population between 250 000 and 1.5 million;
- Large metropolitan areas, with a population of 1.5 million or more.

The **Metropolitan eXplorer** presents socio-economic data of the large two categories of functional urban areas: Metropolitan areas and Large metropolitan areas, in other words, metropolitan areas with a population of 250 000 or more.

This Guide describes the different indicators, sources and visual techniques available in the Metropolitan eXplorer web tool.

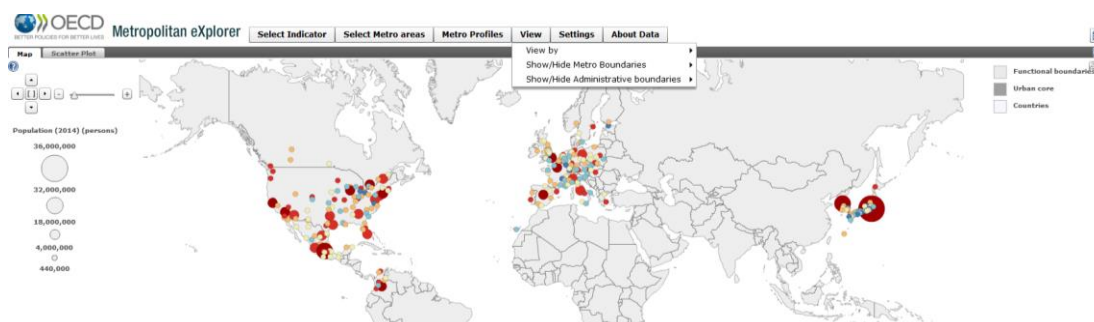
For further information on metropolitan areas, read the publication **OECD Regions at a Glance**, available on **October 9th, 2018** at:

<https://www.oecd.org/governance/oecd-regions-and-cities-at-a-glance-26173212.htm>

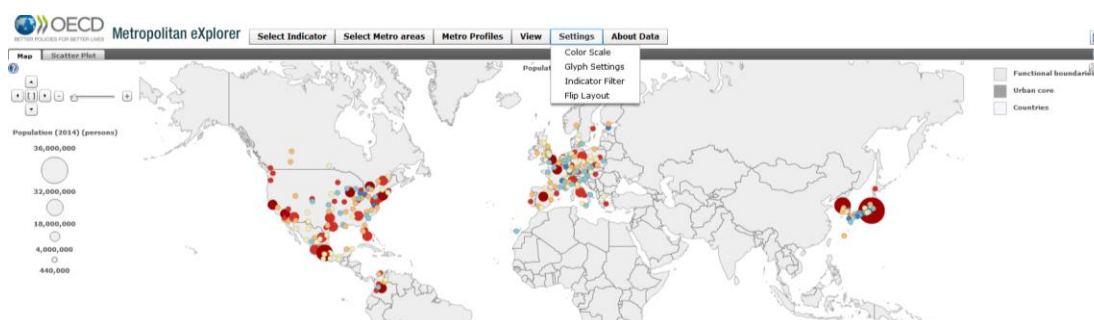
I. Different techniques to visualise the data

The Metropolitan eXplorer² displays the indicators through three different linked dynamic views: a map, a histogram and a scatterplot. Once the indicator has been selected, it appears both on the map and on the histogram. The size of classes in a map can be adjusted by clicking on the values of the classes in the legend. One or more cities can be selected on the map (or on the histogram) by clicking on the city.

City cores and commuting zones are identified respectively on the map in dark/light grey. City cores and commuting zones can be highlighted by clicking on the metropolitan area border. Administrative boundaries of regions can be highlighted, appreciating the difference between the administrative and economic boundaries of the metropolitan areas. Select *View* and choose *Show/Hide administrative boundaries* and *Show/Hide Metro Boundaries*

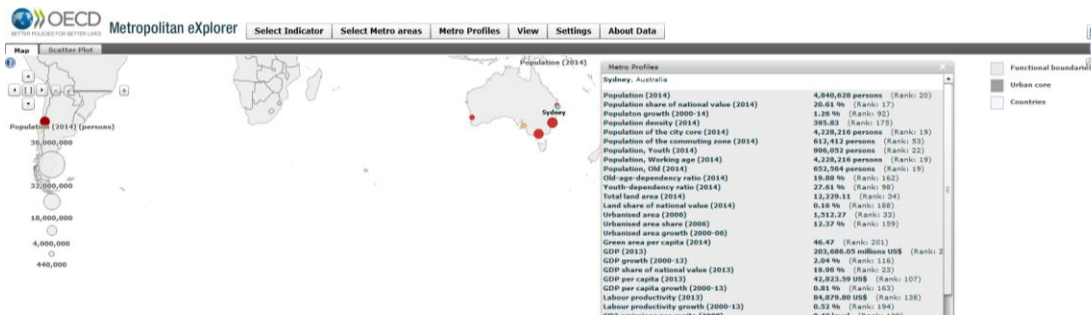


Size and colours can be customized through *Settings*. Colours can be associated either to the intensity of the indicator chosen, or to countries (Select *View, Color*).

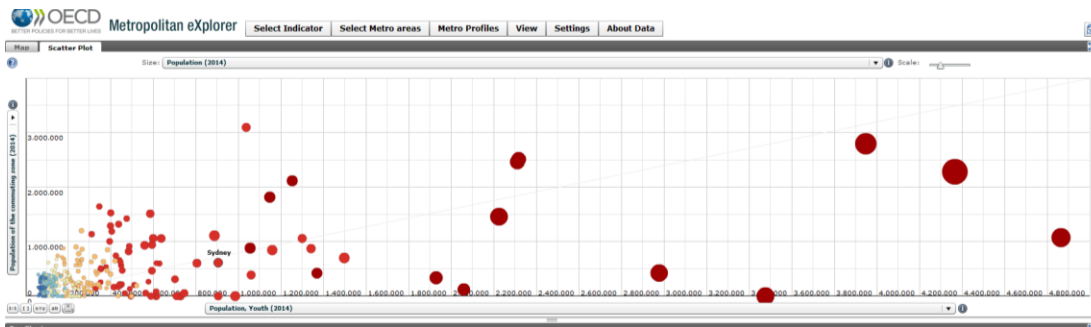


² Disclaimer: maps are for illustrative purposes and are without prejudice to the status of or sovereignty over any territory covered by these maps.

Select the *Metro Profiles* to have a summary view of the performance of a single metropolitan area compared to the national value as well as to the other metropolitan areas.



The *scatterplot* allow the visualisation of three variables for each metropolitan area at the same time. You can choose the variables to be plotted on the X-axis, on the Y-axis and on the size of the bubbles.



II. Indicators and years available

The following indicators are available in the Metropolitan eXplorer for all the metropolitan areas as well as for the national averages.

Group	Indicator	Description	Year
Population	Population (persons)	Population by municipality from the year 2016.	2016
	Population share of national value (%)	Share of the metropolitan population over the national value.	2016
	Population growth (%)	Annual average population growth over the period 2010-16.	2010-16
	Population density (persons per km²)	Ratio between total population and total land area.	2016
Population by age	Youth population	Population between 0-14 years old by municipality.	2016
	Working age population	Population between 15-64 years old by municipality.	2016
	Old population	Population by above 64 years old by municipality.	2016
	Old-age-dependency ratio	Ratio between the elderly population (65+ years) over the working age population (15-64 years old)	2016
	Youth-dependency ratio	Ratio between the youth population (0-14 years old) over the working age population (15-64 years old)	2016
Area	Total land area (km²)	Total land area of the metropolitan area.	2014
	Urbanised area (km²)	The urbanised area is defined as the land area covered by buildings or infrastructure for urban use. It includes, for example, residential and non-residential buildings, major roads, railways, and sport facilities.	2016
	Urban area growth (%)	Annual average growth of the urbanised area over the period 2000-14.	2000-14
GDP	GDP (millions US\$)	Estimates of GDP of metropolitan areas, expressed in millions of US\$, constant prices and constant PPPs, OECD base year (2010). The estimates are derived from the values of TL3 regions (except for Australia, Canada, Chile and Mexico (TL2) and the United States (Bureau of Economic Accounts)).	2016
	GDP growth (%)	GDP growth over the period 2010-16.	To be updated
	GDP share of national value (%)	Share of metropolitan area GDP over national GDP	To be updated
	GDP per capita (US\$)	GDP per capita expressed in US\$, constant prices and constant PPPs, OECD base year (2010).	2016 (except for Austria, Colombia, Germany, Estonia, Finland, France, Hungary, Ireland, Italy, Japan, Norway, Poland, Spain, Sweden and

GDP			Switzerland [2016]).
	Labour productivity (US\$)	GDP per employee expressed in US\$, constant prices and constant PPPs, OECD base year (2010).	To be updated
Labour market	Employment (level)	Estimated total employment in a metropolitan area. The estimates are derived from the TL3 regional values except for Poland, Mexico, Chile and Colombia (TL2), Canada (NOG). Metropolitan figures for the United States and Australia are provided by the U.S. Bureau of Labour Statistics and Australian Bureau of Statistics respectively.	2016
	Employment share of national value (%)	Share of metropolitan unemployment over the national value.	2016
	Employment growth (%)	Annual average employment growth over the period 2010-16.	2010-16
	Unemployment (level)	Estimated total unemployment in a metropolitan area. The estimates are derived from the TL3 regional values except for Poland, Mexico, Chile and Colombia (TL2), Canada (NOG). Metropolitan figures for the United States and Australia are provided by the U.S. Bureau of Labour Statistics and Australian Bureau of Statistics respectively.	2016
	Unemployment share of national value (%)	Share of metropolitan unemployment over the national value.	2016
	Unemployment growth (%)	Unemployment growth over the period 2010-16.	2010-16
Labour market	Labour force (level)	Estimated total labour force in a metropolitan area. The estimates are derived from the TL3 regional values except for Poland, Mexico, Chile (TL2), Canada (NOG). Metropolitan figures for the United States and Australia are provided by the U.S. Bureau of Labour Statistics and Australian Bureau of Statistics respectively.	2016 (except for Austria, Australia, Czech Republic and Switzerland [2013] and Slovenia [2011]).
	Labour force share of national value (%)	Share of the metropolitan labour force over the national value.	2016 (except for Austria, Australia, Czech Republic and Switzerland [2013] and Slovenia [2011]).

	Labour force growth (%)	Annual average labour force growth over the period 2010-16.	2010-16 (except for Australia, Austria and Czech Republic [2000-13], Denmark [2007-14], Germany and Colombia [2001-14], Switzerland [2010-13], Slovenia [2001-11]).
Urban form	Polycentricity (count)	Number of non contiguous core areas by metro area.	2016
Territorial organisation	Local governments (count)	Number of local governments in a metropolitan area. Only the lowest tier of government is considered and only general- purposes governments.	2016
	Local governments in the core (count)	Number of local governments in the core areas of the metropolitan area.	2016

III. Data sources and estimation techniques to compile the indicators

1. Socio-economic statistics

Social, economic and labour statistics at sub-national level (such as GDP and Labour) which are comparable across countries are generally available for administrative regions (TL2 and TL3 regions of the OECD Regional database). While a set of indicators may in the future become available for the OECD functional urban areas, at present we suggest to derive estimates of the main economic indicators by adjusting existing regional data to the non-administrative boundaries.

GIS techniques are increasingly adopted in the literature, especially in the field of environmental indicators and other issues that are particularly attached to the geography of the territory, rather than their functional or political organisation (Nordhaus *et al.*, 2006; Milego and Ramos, 2006; Doll *et al.*, 2000). On the basis of the methods that have been used in the literature to adjust indicators at small-scale geography, the OECD has decided to make use of Geographic Information System (GIS) tools to disaggregate socio-economic data. The methodology is similar to that applied by Milego and Ramos (2006) to downscale socio-economic data from European administrative regions to a 1 km² regular grid level within the context of an Espon research (European Observation Network for Territorial Development).

The proposed methodology uses the socio-economic values (GDP, employment and unemployment) in TL3 regions as data inputs and the distribution of population based on census data. The methodology to adjust socio-economic data to metropolitan areas has evolved from the use of raster population data (i.e. Landsat) to municipal population census data as the input data source. This change has allowed the use of more up-to-date data (census data c.a. 2011) as well as the use of harmonised municipal boundaries over time. Indeed, long time-series have been generated using consistent boundaries of municipalities between the two census data points by using GIS techniques.

The suggested methodology is composed of three main steps:

- Intersect the municipal boundaries with the TL3 boundaries by the use of GIS techniques;
- Attribute each municipality a GDP value by weighting for the population in each municipality; and
- Calculate the sum of municipalities' GDP values belonging to each metro area.

An improved method would be to use employment data rather than population data in step 2. For example, the United Kingdom Office for National Statistics provides income estimates at ward level down-scaling the regional values through various variables including household size, employment status, proportion of the ward population claiming social benefits, and proportion of tax payers in each of the tax bands, etc. A similar method is used by the U.S. Bureau of Economic Analysis to estimate the GDP for U.S. Metropolitan Statistical Areas. The Federal Statistical Office of Switzerland used CLC-Data-Classes urban continuous fabric, urban discontinuous fabric and industrial or commercial units for all neighbouring countries by calibrating with other data to estimate data for jobs in grid cells. However these types of data input are not available in most OECD countries therefore a simpler solution was adopted.

A similar technique is applied to estimate employment and unemployment in metropolitan areas with working age population (15-65 years old) used as data input in step 2.

It has to be noted that the estimates of GDP, employment and unemployment in the metropolitan areas do not adhere to international standards; the comparability among countries relies on the use of the same methodology applied to areas defined with the same criteria.

2. Urban form

The following variables were compiled to measure urban form:

The *polycentricity* is given by the number of city cores included in a metropolitan area.

The *concentration of population in the city core* is the share of metropolitan population that lives in the urban cores of the metropolitan area. It provides a measure of the relative importance of urban cores versus hinterlands.

3. Territorial organisation

Several studies have analysed the structure of the metropolitan area governance in relation to the efficiency and equity of service delivery, government efficiency, the distribution of wealth within a metropolitan area, among others. As a first simplified measure of administrative organisation we consider the number of *local governments*, the *average population size of municipalities* and the *territorial fragmentation* defined as the number of local governments in a metropolitan area per 100,000 inhabitants.

To identify the number of local governments included in a metropolitan area two simplifying assumptions have been considered:

- Only general-purpose local governments are included, while the specific function governments are excluded (for example school district, health agencies, etc.).
- Only one local level of government has been included, notably the lowest tier, as a measure of the horizontal fragmentation. Of course the administrative structure of a country may include more than one level of government with relevant responsibilities over the same territory covered by the metropolitan area.

4. Data sources

Indicator	Data sources
<i>Population</i>	The population by municipality for the years 2000 and 2014 comes from the Population Census. The population by municipality from the Census 2012 is then recomputed according to the metropolitan boundaries of 2001. The metropolitan population between the years 2000 and 2014 is estimated
<i>GDP</i>	Estimated based on GDP data at TL3 level from OECD Regional Database http://stats.oecd.org/Index.aspx?datasetcode=REG_DEMO_TL3
<i>Labour</i>	Estimated based on labour data at TL3 level from OECD Regional Database http://stats.oecd.org/Index.aspx?datasetcode=REG_DEMO_TL2
<i>Total, Green and Urbanised area</i>	US: NLCD 2001 (Version 2) and NLCD 2006 databases; Japan: Japan National Land Information 1997 and 2006; EU (except Northern Ireland): CORINE Land Cover 2000 and CORINE Land Cover Changes 2000-2006; Canada, Korea and Mexico: MODIS Land Cover data 2008, urban class refers circa to year 2001-2002. Data are derived from medium spatial resolution (500m) satellite imagery and should be taken as rough estimates.

Country	Name of local governments in the territorial organisation	Source
Austria	Gemeinden (LAU2)	EUROSTAT
Belgium	Gemeenten/Communes (LAU2)	EUROSTAT
Canada	Census Subdivisions (towns, villages, etc.) (CSD)	Statistics Canada (Statcan)
Switzerland	Municipalities (LAU2)	EUROSTAT
Chile	Comunas	Instituto Nacional de Estadísticas (INE) Chile
Czech Republic	Obce (LAU2)	EUROSTAT
Germany	Gemeinden (LAU2)	EUROSTAT
Denmark	Sogne (LAU2)	EUROSTAT
Estonia	Vald, linn (LAU2)	EUROSTAT
Spain	Municipios (LAU2)	EUROSTAT
Finland	Kunnat / Kommuner (LAU2)	EUROSTAT
France	Communes (LAU2)	EUROSTAT
Greece	Demotiko diamerisma/Koinotiko diamerisma (LAU2)	EUROSTAT
Hungary	Települések (LAU2)	EUROSTAT
Ireland	Electoral Districts (LAU1)	EUROSTAT
Italy	Comuni (LAU2)	EUROSTAT
Japan	Shi (city), Machi or Cho (town) and Mura or Son (village)	National Land Numerical Information Service of Japan
Korea	Si (city), Gun (county), Gu (district)	Korean Statistical Information Service (KOSIS)
Luxembourg	Communes (LAU2)	EUROSTAT
Mexico	Municipios	Instituto Nacional de Estadística y Geografía (INEGI)
Netherlands	Gemeenten (LAU2)	EUROSTAT
Norway	Municipalities (LAU2)	EUROSTAT
Poland	Gminy (LAU2)	EUROSTAT
Portugal	Freguesias (LAU2)	EUROSTAT
Sweden	Kommuner (LAU2)	EUROSTAT
Slovenia	Občine (LAU2)	EUROSTAT
Slovak Republic	Obce (LAU2)	EUROSTAT
United Kingdom	County Councils. For those areas where the County Councils were abolished the Local Authority (either a Metropolitan District Council or a Unitary District Council) is used. For London, the Borough Councils are used.	UK Office of National Statistics
United States	Municipalities or townships. In the geographic areas where municipalities or townships do not represent a general purpose government, the County governments were considered.	U.S. Census Bureau "2002 Census of Governments"

IV. References

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